

REMARKS

By this Amendment, Applicants have amended the claims to delete the reference numerals therefrom. Applicants have also added claims 17-23 to further define the invention. Claims 17-20 correspond to claims 13-16, respectively, but are written in "method" format. Claims 21-23 further define the relationship between the enclosure and the envelope. These claims are supported by, e.g., Figures 1-3, the fourth full paragraph on page 6 and the last paragraph on page 7 of Applicants' specification.

Claims 1, 3, 10 and 13-16 stand rejected under 35 U.S.C 102(b) as allegedly being anticipated by U.S. Patent No. 5,554,347 to Busson et al or U.S. Patent No. 5,270,016 to Alagy et al. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a reactor device for carrying out chemical reactions requiring heat exchange. As shown, by way of example only in the figures, e.g., Figures 1 and 2, the reactor R is elongate along an axis XX' and has, at a first end, at least one means 16 for supplying at least one reactant, and, at an opposite end, at least one means 18 for evacuating effluents. A plurality of heat exchange means 12 are provided in the reactor R and they are separated by at least by internal partition 14 participating in controlling the residence time of the reactant or reactants and increasing the heat exchange surface inside the reactor. Passages are provided for circulating the reactant or reactants and/or effluents between the heat exchange means 12 and the internal partitions 14. The reactor of the present

invention has at least one enclosure 10 made of a refractory material ensuring heat insulation and containing the heat exchange means 12 and the internal partitions 14. The enclosure 10 is contained in an envelope 20 containing the reactant and/or reactants and/or effluents circulating inside the reactor.

The enclosure 10 can have a dual roll. That is, it is a heat insulator to protect the outer containment envelop 20 of the reactor R and may have a shape generating the internal space necessary for its participation for controlling the flow and residence time of the fluid circulating in the reactor.

The patent to Busson et al. discloses an apparatus comprising a reactor, elongated along one axis, preferably of square or rectangular cross section. The reactor has, at one extremity, at least one supply line for at least one reactant and at least one evacuation outlet at the other extremity for removal of produced effluents. In a first zone (near the first extremity of the reactor), a plurality of heat exchangers, substantially parallel to each other, are disposed in substantially parallel layers perpendicular to the reactor axis, thereby defining spaces or passages for circulation of reactant(s) and/or effluents between the heat exchangers and/or layers formed by the heat exchanger. The heat exchangers are adapted to exchange heat in the passages through successive transverse sections, which are independent and substantially perpendicular to the reactor axis. At least some of the heat exchangers comprise a tubular element formed by at least one shell, supplied with a heat exchange gas or gas mixture, and at least one evacuation element for evacuating the circulating gas or gas mixture which has

undergone heat exchange with the reactant(s) and/or effluents.

The Examiner alleges the Busson et al. patent to teach the use of an enclosure as presently claimed. In this regard, the Examiner equates the projecting portion 12 of Busson et al. to the presently claimed enclosure. However, in Busson et al., it appears the projecting portions 12 are provided only on the inner surface of two opposite walls. See, Figures 1B and 1C. The two projecting portions 12, therefore, do not constitute an “enclosure.” An “enclosure” is defined as “something that encloses”; “enclose” is defined as “to surround on all sides.” The projecting portions 12 of Busson et al., provided on only two side walls do not surround the heat exchange means and internal partitions on all sides in Busson et al. Therefore, the Busson et al. patent does not disclose a reactor including the presently claimed enclosure.

The patent to Alagy et al. discloses an apparatus for a thermal conversion of methane. Figures 1A, 1B and 1C are longitudinal sections through a reactor in a plane perpendicular to the axis of the sheaths 4 surrounding the electrical heaters 3. In the case of Figure 1B, the reactor contains a lining. In the case of Figure 1C, it has wall separating successive sets of sheaths. Figures 1D and 1E are longitudinal sections through the reactor along the axis of the sheaths while Figure 2 illustrates a detail of the heating zone in the same plane as that in Figures 1B and 1E. Figure 1C appears to show an arrangement similar to that in Busson et al. with walls 22 corresponding to the walls on projecting portions 11 and 12 in Busson et al. Figure 2 shows the detail of the embodiment in the heating zone of the same plane as that in Figures 1B and 1E. It is disclosed that the reactor can be

made of rectangular cross section and the walls being made of insulating refractory concrete 14 and a metallic reinforcement 15. However, since Figure 2 shows only one of the two opposed side walls into which is passed the sheath 4, it is not clear that the concrete 14 forms an "enclosure," as presently claimed. Therefore, the Alagy et al. patent does not identically disclose the presently claimed invention and does not anticipate the present claims.

Claims 2, 4-9, 11 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Busson et al. or Alagy et al. in view of U.S. Patent 4,612,982 to Grehier et al. Applicants traverse this rejection and request reconsideration thereof.

The Examiner relies on the teachings of Grehier et al. only for demonstrating that heat transfer plates can be stacked into lattices to form a modular structure. However, clearly the Grehier et al. patent does not remedy any of the deficiencies noted above with respect to Busson et al. and Alagy et al.

Moreover, the Examiner's reference to aspects of the present invention being "merely a matter of obvious engineering choice," etc. without providing any teachings in the prior art supporting these conclusions is not the type of objective evidence and specific factual findings necessary to support an obviousness rejection. *In re Lee*, 277 F3d 1338, 1342-44, 61 USPQ 2d 1430, 1433-34 (Fed. Cir. 2002).

For the foregoing reasons, claims 2, 4-9, 11 and 12 are patentable over the proposed combination of references.

• In view of the foregoing amendments and remarks, favorable
reconsideration and allowance of all the claims now in the application are
requested. ©

To the extent necessary, applicants petition for an extension of time
under 37 CFR 1.136. Please charge any shortage in the fees due in
connection with the filing of this paper, including extension of time fees, to the
deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No.
01-2135 (Case: 612.41239X00), and please credit any excess fees to such
deposit account.

Respectfully submitted,

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